IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application. An identifier indicating the status of each claim is provided.

Listing of Claims

1. (Currently Amended)   An information processing apparatus comprising:

reading means for reading data and improvement information used for improving the quality of the data from a recording medium which stores the data and the improvement information;

improvement-information requesting means for requesting another improvement information used for improving the quality of the data read by the reading means; and

quality improving means for improving the quality of the data according to at least both the improvement information and the another improvement information obtained according to a request made by the improvement-information requesting means and for outputting high-quality data.

2. (Currently Amended)   An information processing apparatus according to Claim 1, wherein the data is degraded data obtained by degrading the original data; and

the quality improving means can restore the original data from the degraded data according to at least both the improvement information and the another improvement information.

3. (Original) An information processing apparatus according to Claim 1, wherein the quality improving means makes high-quality data of which the quality is improved by N+1 (N is a natural number) pieces of the improvement information and which is output have higher quality than high-quality data of which the quality is improved by N pieces of the improvement information and which is output.

4. (Original) An information processing apparatus according to Claim 2, wherein the data is high-order bits of the original data and the improvement information is a part of low-order bits of the original data; and

the quality improving means combines the high-order bits of the original data, which is the data; the part of low-order bits of the original data, which is the improvement information; and the other part of lower-order bits of the original data, which is the another improvement information, to output high-quality data having higher quality than the data.

5. (Original) An information processing apparatus according to Claim 4, further comprising determination means for determining whether the quality improving means can apply quality improvement processing to the data according to the improvement information and at least one piece of the another improvement information obtained according to a request made by the improvement-information requesting means,

wherein the quality improving means improves the quality of the data according to a result of determination made by the determination means and outputs high-quality data.

6. (Original) An information processing apparatus according to Claim 2, wherein the data is first sub-sampled data obtained by sub-sampling the original data at a first phase and the improvement information is second sub-sampled data obtained by sub-sampling the original data at a second phase; and

the quality improving means combines the first sub-sampled data, which is the data; the second sub-sampled data, which is the improvement information; and third sub-sampled data obtained by sub-sampling the original data at a third phase, which is the another improvement information, to output high-quality data having higher quality than the data.

7. (Original) An information processing apparatus according to Claim 6, wherein the data is first sub-sampled data obtained by sub-sampling the original data at a first phase and the improvement information is second sub-sampled data obtained by sub-sampling the original data at a second phase; and

the quality improving means comprises:

extracting means for extracting at least first sub-sampled data, second sub-sampled data, and third sub-sampled data around the target data in the high-quality data;

class-classification means for performing class-classification according to data extracted by the extracting means and for outputting a class; and

prediction means for predicting the target data from the extracted data according to the class output from the class-classification means.

8. (Original) An information processing apparatus according to Claim 7, wherein the extracting means extracts first taps and second taps from at least the first sub-sampled data, the

second sub-sampled data, and the third sub-sampled data around the target data in the high-quality data;

the class-classification means performs class-classification according to the first taps and outputs a class; and

the prediction means predicts the target data by linear first-order coupling of the second taps and learned-in-advance prediction coefficients according to the class output from the class-classification means.

9. (Original)   An information processing apparatus according to Claim 2, wherein the quality improving means comprises:

extracting means for extracting degraded data around the target data in the high-quality data;

class-classification means for performing class-classification according to data extracted by the extracting means and for outputting a class; and

prediction means for predicting the target data from the extracted data according to the class output from the class-classification means.

10. (Original)   An information processing apparatus according to Claim 9, further comprising prediction-coefficient storage means for storing prediction coefficients obtained by learning in advance between the original data and the degraded data,

wherein the prediction means predicts the target data by linear first-order coupling of the extracted data and the prediction coefficients according to the class output from the class-classification means; and

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the improvement information is a part of the prediction coefficients.

11. (Original)   An information processing apparatus according to Claim 10, wherein the extracting means extracts first taps and second taps from degraded data around the target data in the high-quality data;

the class-classification means performs class-classification according to the first taps and outputs a class; and

the prediction means predicts the target data by linear first-order coupling of the second taps and the prediction coefficients according to the class output from the class-classification means.

12. (Original)   An information processing apparatus according to Claim 1, further comprising:

improvement-information-request-signal receiving means for receiving an improvement-information request signal indicating that another information processing apparatus requests the improvement information; and

improvement-information sending means for sending the improvement information to the another information processing apparatus according to an improvement-information request signal received by the improvement-information-request-signal receiving means.

13. (Currently Amended)   An information processing apparatus comprising:

reading means for reading data and improvement information used for improving the quality of the data from a recording medium which stores the data and the improvement information;

improvement-information requesting means for requesting another improvement information used for improving the quality of the data read by the reading means;

quality improving means for improving the quality of the data according to at least <u>both</u> the improvement information and the another improvement information obtained according to a request made by the improvement-information requesting means and for outputting high-quality data; and

improvement-information sending means for sending the improvement information to another information processing apparatus.

14. (Currently Amended)   An information processing apparatus according to Claim 13, wherein the data is degraded data obtained by degrading the original data; and

the quality improving means can restore the original data from the degraded data according to at least <u>both</u> the improvement information and the another improvement information.

15. (Original)   An information processing apparatus according to Claim 13, wherein the quality improving means makes high-quality data of which the quality is improved by N+1 (N is a natural number) pieces of the improvement information and which is output have higher quality than high-quality data of which the quality is improved by N pieces of the improvement information and which is output.

16. (Original)   An information processing apparatus according to Claim 14, wherein the data is high-order bits of the original data and the improvement information is a part of low-order bits of the original data; and

the quality improving means combines the high-order bits of the original data, which is the data; the part of low-order bits of the original data, which is the improvement information; and the other part of lower-order bits of the original data, which is the another improvement information, to output high-quality data having higher quality than the data.

17. (Original)   An information processing apparatus according to Claim 16, further comprising determination means for determining whether the quality improving means can apply quality improvement processing to the data according to the improvement information and at least one piece of the another improvement information obtained according to a request made by the improvement-information requesting means,

wherein the quality improving means improves the quality of the data according to a result of determination made by the determination means and outputs high-quality data.

18. (Original)   An information processing apparatus according to Claim 14, wherein the data is first sub-sampled data obtained by sub-sampling the original data at a first phase and the improvement information is second sub-sampled data obtained by sub-sampling the original data at a second phase; and

the quality improving means combines the first sub-sampled data, which is the data; the second sub-sampled data, which is the improvement information; and third sub-sampled data

obtained by sub-sampling the original data at a third phase, which is the another improvement

information, to output high-quality data having higher quality than the data.

19. (Original)   An information processing apparatus according to Claim 18, wherein

the data is first sub-sampled data obtained by sub-sampling the original data at a first phase and

the improvement information is second sub-sampled data obtained by sub-sampling the original

data at a second phase; and

the quality improving means comprises:

extracting means for extracting at least first sub-sampled data, second sub-sampled data,

and third sub-sampled data around the target data in the high-quality data;

class-classification means for performing class-classification according to data extracted

by the extracting means and for outputting a class; and

prediction means for predicting the target data from the extracted data according to the

class output from the class-classification means.

20. (Original)   An information processing apparatus according to Claim 19, wherein

the extracting means extracts first taps and second taps from at least the first sub-sampled data,

the second sub-sampled data, and the third sub-sampled data around the target data in the high-

quality data;

the class-classification means performs class-classification according to the first taps and

outputs a class; and

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the prediction means predicts the target data by linear first-order coupling of the second

taps and learned-in-advance prediction coefficients according to the class output from the class-

classification means.

21. (Original)   An information processing apparatus according to Claim 14, wherein

the quality improving means comprises:

extracting means for extracting degraded data around the target data in the high-quality

data;

class-classification means for performing class-classification according to data extracted

by the extracting means and for outputting a class; and

prediction means for predicting the target data from the extracted data according to the

class output from the class-classification means.

22. (Original)   An information processing apparatus according to Claim 21, further

comprising prediction-coefficient storage means for storing prediction coefficients obtained by

learning in advance between the original data and the degraded data,

wherein the prediction means predicts the target data by linear first-order coupling of the

extracted data and the prediction coefficients according to the class output from the class-

classification means; and

the improvement information is a part of the prediction coefficients.

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23. (Original)   An information processing apparatus according to Claim 22, wherein the extracting means extracts first taps and second taps from degraded data around the target data in the high-quality data;

the class-classification means performs class-classification according to the first taps and outputs a class; and

the prediction means predicts the target data by linear first-order coupling of the second taps and the prediction coefficients according to the class output from the class-classification means.

24. (Original)   An information processing apparatus according to Claim 13, further comprising:

improvement-information-request-signal receiving means for receiving an improvement-information request signal indicating that another information processing apparatus requests the improvement information,

wherein the improvement-information sending means sends the improvement information to the another information processing apparatus according to an improvement-information request signal received by the improvement-information-request-signal receiving means.

25. (Original)   An information processing apparatus according to Claim 13, wherein the improvement-information requesting means sends an improvement-information request signal which includes the identification information of the data read by the reading means; the identification information of the improvement information, and user identification information.

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26. (Withdrawn) An information processing apparatus comprising:

storage means for storing user information which includes user identification information used for identifying a user terminal, and improvement-information identification information used for identifying improvement information improving the quality of data processed in the user terminal;

searching means for searching the storage means for the user information having the improvement information requested by the user terminal;

improvement-information requesting means for requesting the improvement information from another user terminal corresponding to the user information searched for by the searching means;

obtaining means for obtaining the improvement information from the another user terminal according to a request made by the improvement-information requesting means; and

sending means for sending the improvement information obtained by the obtaining means to the user terminal.

27. (Withdrawn) An information processing apparatus according to Claim 26, wherein the obtaining means obtains a plurality of different pieces of improvement information from each of a plurality of other user terminals, and

the sending means sends the plurality of different pieces of improvement information.

28. (Withdrawn) An information processing apparatus according to Claim 26, further comprising:

accounting-information storage means for storing the user identification information and

accounting information for the user identified by the user identification information; and

control means for controlling, when the obtaining means obtains the improvement

information from the another user terminal, updating of the accounting information

corresponding to the user identification information corresponding to the another user terminal,

stored in the accounting-information storage means,

wherein the control means updates the accounting information such that the consideration

corresponding to the improvement information is transferred to the user corresponding to the

user identification information.

29. (Withdrawn)   An information processing apparatus according to Claim 28,

wherein the control means updates, when the sending means sends the improvement information

from the another user terminal to the user terminal, the accounting information corresponding to

the user identification information corresponding to the user terminal, stored in the accounting-

information storage means, and

the control means updates the accounting information such that the consideration

corresponding to the improvement information is charged to the user corresponding to the user

identification information.

30. (Withdrawn)   An information processing apparatus according to Claim 29,

further comprising accounting processing means for applying accounting processing to an

account of the user corresponding to accounting information according to the accounting

information stored in the accounting-information storage means.

31. (Currently Amended)   An information processing method comprising the steps of:

reading data and improvement information used for improving the quality of the data

from a recording medium which stores the data and the improvement information;

requesting another improvement information used for improving the quality of the read

data; and

improving the quality of the data according to <u>both</u> at least the improvement information

and the another improvement information obtained according to the request and outputting high-

quality data.

32. (Currently Amended)   An information processing method comprising the steps of:

reading data and improvement information used for improving the quality of the data

from a recording medium which stores the data and the improvement information;

requesting another improvement information used for improving the quality of the read

data;

improving the quality of the data according to at least <u>both</u> the improvement information

and the another improvement information obtained according to the request and outputting high-

quality data; and

sending the improvement information to another information processing apparatus.

33. (Withdrawn) An information processing method comprising the steps of:

searching storage means for user information having improvement information requested

by a user terminal, the storage means storing user information which includes user identification

information used for identifying the user terminal and improvement-information identification information used for identifying improvement information improving the quality of data processed in the user terminal;

requesting the improvement information from another user terminal corresponding to the user information searched for;

obtaining the improvement information from the another user terminal according to the request; and

sending the obtained improvement information to the user terminal.

34. (Currently Amended)   A storage medium storing a computer-controllable program, the program comprising the steps of:

reading data and improvement information used for improving the quality of the data from a recording medium which stores the data and the improvement information;

requesting another improvement information used for improving the quality of the read data; and

improving the quality of the data according to at least <u>both</u> the improvement information and the another improvement information obtained according to the request and outputting high-quality data.

35. (Currently Amended)   A storage medium storing a computer-controllable program, the program comprising the steps of:

reading data and improvement information used for improving the quality of the data from a recording medium which stores the data and the improvement information;

requesting another improvement information used for improving the quality of the read data;

improving the quality of the data according to at least <u>both</u> the improvement information and the another improvement information obtained according to the request and outputting high-quality data; and

sending the improvement information to another information processing apparatus.

36. (Withdrawn)   A storage medium storing a computer-controllable program, the program comprising the steps of:

searching storage means for user information having improvement information requested by a user terminal, the storage means storing user information which includes user identification information used for identifying the user terminal and improvement-information identification information used for identifying improvement information improving the quality of data processed in the user terminal;

requesting the improvement information from another user terminal corresponding to the user information searched for;

obtaining the improvement information from the another user terminal according to the request; and

sending the obtained improvement information to the user terminal.

37. (Currently Amended)   A storage medium ~~storing~~ storing:

data; and

improvement information for improving the quality of the data and for improving the quality of another data stored in another storage medium,

wherein the data is degraded data obtained by degrading the original data, and the original data can be restored from the degraded data according to at least both the improvement information and another improvement information stored in the another storage medium.

38. (Canceled)

39. (Currently Amended)   A storage medium according to Claim ~~38~~ 37,

wherein the data is high-order bits of the original data and the improvement information is a part of low-order bits of the original data; and

the high-order bits of the original data, which is the data; the part of low-order bits of the original data, which is the improvement information; and the other part of lower-order bits of the original data, which is the another improvement information, are combined to output high-quality data having higher quality than the data.

40. (Currently Amended)   A storage medium according to Claim ~~38~~ 37,

wherein the data is first sub-sampled data obtained by sub-sampling the original data at a first phase and the improvement information is second sub-sampled data obtained by sub-sampling the original data at a second phase; and

the first sub-sampled data, which is the data; the second sub-sampled data, which is the improvement information; and third sub-sampled data obtained by sub-sampling the original data

at a third phase, which is the another improvement information, are combined to output high-

quality data having higher quality than the data.